

Using Jet Observations to Constrain Enceladus' Rotation State

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Observations of Enceladus have revealed active jets of material erupting from cracks on its surface. It has been proposed that diurnal tidal stress may open these cracks daily when they experience tensile stresses across them, allowing eruptions to occur. An analysis of the tidal stress on jet source regions, as identified by the triangulation of jet observations, finds that there is a correlation between observations and tensile stress on the cracks. However, not all regions are predicted to be in tension when jets were observed to be active. Enceladus' rotation state, such as a physical libration or obliquity, will affect the diurnal stresses on these cracks, changing when in its orbit they experience tension and compression. We will use observations of jet activity from 2005-2007 to place constraints on rotation states of Enceladus.